Small Business Innovation Research/Small Business Tech Transfer

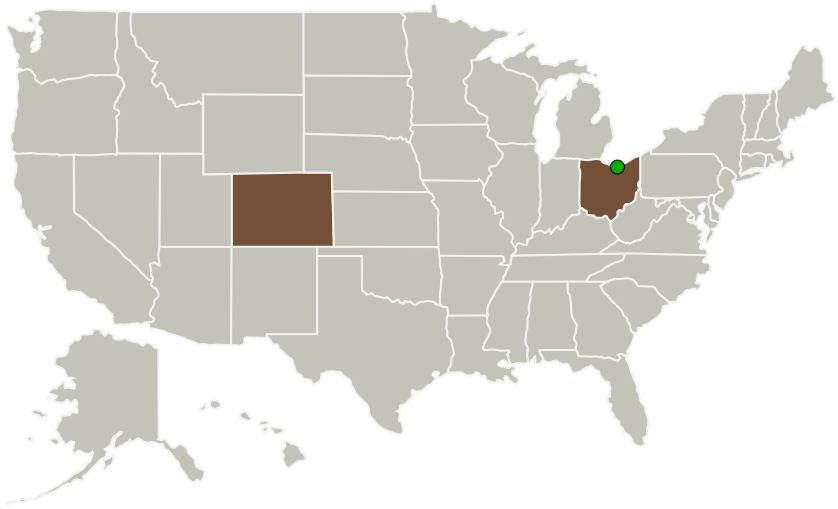
Micro-Laser Communications Modules, Phase I

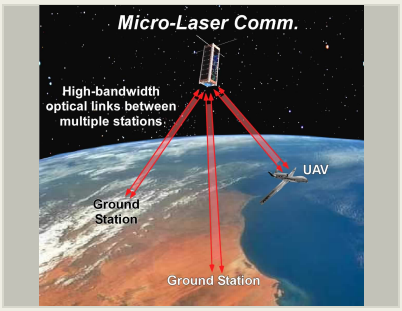
Completed Technology Project (2013 - 2013)

Project Introduction

High bandwidth communication links are needed between satellites and ground stations, inter-satellite, and to airborne assets. As data loads increase and satellites available payloads decrease keeping the information flowing becomes even more challenging. In this SBIR program we will design and demonstrate the feasibility of ultra-low Size, Weight, and Power (SWaP) Micro-Laser Communications (MiLC) modules for high bandwidth (up to Gbps or possibly much higher) data links between miniature satellites (e.g. cube-sats), and ground stations, satellite clusters, and/or airborne assets. One possible laser comm. modules will fit within a few cubic inch volume, require less than 1 watt of power and be able to provide ground station tracking (including orbital motion over wide angles and jitter correction) with a >100 Mbps downlink and no moving parts. Higher bandwidths are possible with trade-offs. This will be enabled by replacing heavy and power consumptive mechanical scanners with new, game changing wide angle (120o x 120o), electro-optic laser scanners.

Primary U.S. Work Locations and Key Partners





Micro-Laser Communications Modules

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Organizations Performing Work	Role	Type	Location
Vescent Photonics, Inc.	Lead Organization	Industry	Arvada, Colorado
Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations	
Colorado	Ohio

Project Transitions

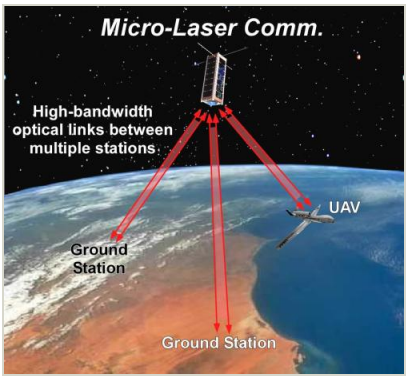
May 2013: Project Start

November 2013: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138300)*

Images



Project Image
Micro-Laser Communications Modules
(https://techport.nasa.gov/image/127144)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Vescent Photonics, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Scott R Davis

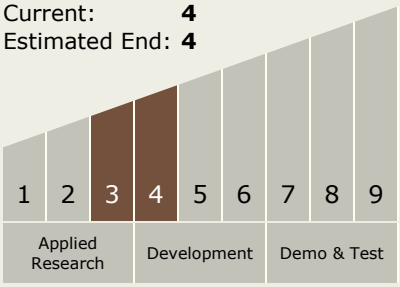
Co-Investigator:
Scott Davis

Micro-Laser Communications Modules, Phase I

Completed Technology Project (2013 - 2013)

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
  - TX05.1 Optical Communications
    - TX05.1.3 Lasers

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System